Sub B1

CLAIMS

1. A Coriolis mass flow meter comprising two parallel curved flow tubes, an inlet-side manifold branching from an inlet of a fluid being measured to said two flow tubes, an outlet-side manifold for joining fluid flows flowing in said two flow tubes to discharge from a fluid outlet, a drive unit for causing any one of said flow tubes to resonate with the other flow tube in an opposite phase with each other, and a pair of vibration sensors, disposed at symmetrical positions with respect to the mounting position of said drive unit, for sensing a phase difference proportional to Coriolis force, characterized in that

a meter body holds connecting ports at both ends and the entire flow meter, and

said meter body is mechanically connected to said inlet-side and outlet-side manifolds only at the inlet-side of said inlet-side manifold and at the outlet side of said outlet-side manifold, respectively, so that the joint parts between said inlet-side and outlet-side manifolds and said flow tubes that serve as vibration fulcrums, can be isolated from said meter body and all structures connected thereto.

2. A Coriolis mass flow meter as set forth in Claim 1 wherein a flow path of said inlet-side manifold is smoothly curved from the inlet thereof, branching into two flow tubes while continuously reducing the total cross-sectional area of flow paths of said two flow tubes; and flow paths of said outlet-side manifold are smoothly curved from the joint parts thereof with said flow tubes, joining said flow paths while continuously increasing the total cross-sectional area of said flow paths, and leading to a fluid outlet.

3. A Coriolis mass flow meter as set forth in Claim 2 wherein said inlet-side and outlet-side manifolds are formed into curved blocks whose cross-sectional areas continuously increase toward said joint parts with said flow tubes from said fluid inlet or said fluid outlet.

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4. A Coriolis mass flow meter as set forth in ~~any of~~ Claim~~s~~ 1 wherein said meter body has a U-shaped cross section and a box construction having at the upper part thereof a base plate to prevent said meter body from interfering with said vibration fulcrums.

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5. A Coriolis mass flow meter as set forth in ~~any of~~ Claim~~s~~ 4 wherein said meter body has a U-shaped case having a circular arc-shaped outer circumferential shape and integrally connected thereto.

a

6. A Coriolis mass flow meter as set forth in ~~any of~~ Claim~~s~~ 1 wherein said drive unit and said vibration sensors are disposed between said two flow tubes in such a manner as to be aligned with the central axes of said two flow tubes.

a Sub B2

7. A Coriolis mass flow meter as set forth in ~~any of~~ Claim~~s~~ 1 wherein said drive unit is electrically connected to said vibration sensors at the center axis on the inlet and outlet sides of said flow tubes, using flexible printed circuit boards bent symmetrically from both sides of said two flow tubes, in such a manner that masses and stresses added to said two flow tubes are symmetrical.

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8. A Coriolis mass flow meter as set forth in ~~any of~~ Claim~~s~~ 1 wherein said vibration sensors are disposed at nodes of the secondary vibration mode at the proximal parts each on the inlet and outlet sides that serve as vibration beams.

Sub B3

9 . A Coriolis mass flow meter comprising two parallel flow tubes of a curved tube type, a drive unit disposed at the central part of said flow tubes for causing any one of said

B3

flow tubes to resonate with the other tube in a phase opposite to each other, and a pair of vibration sensors disposed at symmetrical positions with respect to the mounting position of said drive unit for sensing a phase difference proportional to Coriolis force; said drive unit and a pair of said vibration sensors each being formed by a coil and a magnet, characterized in that

said drive unit coil is fitted to any one of said flow tubes and said drive unit magnet is fitted to the other flow tube, and

magnets of said vibration sensors are fitted to any one of said flow tubes and coils of said vibration sensors are fitted to the other flow tube.

10. A Coriolis mass flow meter as set forth in Claim 9 wherein a support post facing at the end thereof said drive unit provided at the central part of said flow tubes and having wires for electrical connection passed therein is provided; a first flexible printed circuit board extending from the end surface of said support post to the one flow tube is connected to said drive unit coil, and a second flexible printed circuit board extending from the end surface of said support post to the other flow tube is connected to wires extended from coils of said vibration sensors along the surface of said flow tubes in such a manner that said flexible printed circuit boards are bent at the central part of said flow tubes almost symmetrically with respect to the vibration center of each flow tube.

add B4